

CLAIMS

What is claimed is:

1. A method for remotely controlling an instrument, comprising:
 - 2 receiving at least one communication from each of at least two clients,
 - 4 wherein each received communication conforms to a client specific protocol;
 - 6
 - 8 determining from which client each received communication was received;
 - 10
 - 12 determining an application resident on the instrument for which each received communication is intended, wherein at least one application is resident on the instrument; and
 - 14 transferring each received communication to the intended application.
2. The method as recited in claim 1, wherein the client specific protocol is the Standard Commands for Programmable Instrumentation (SCPI) protocol.
3. The method as recited in claim 1, wherein the communications from the clients are interpreted into an interpreted command usable by the application module.
4. The method as recited in claim 1, further comprising:
 - 2 separately for each of at least two intended clients, obtaining at least one

4 additional communication from at least one application, wherein each
obtained additional communication conforms to an application specific
6 protocol;

8 determining from which application each obtained additional
communication was obtained;

10 determining for which client each obtained additional communication is
12 intended; and

14 transferring each obtained additional communication to the intended
client.

5. The method as recited in claim 4, wherein the application specific
2 protocol is the Standard Commands for Programmable Instrumentation
(SCPI) protocol.

6. The method as recited in claim 4, wherein the obtained additional
2 communications are modified to produce client messages which are in
appropriate format for the client.

7. The method as recited in claim 4, wherein at least one obtained additional
2 communication is in response to one of the communications received
from one of the at least two clients, wherein the application tracks from
4 which client the received communication originated, and wherein the
application uses that tracking information to direct the at least one
6 obtained additional communication to the client from which the received
communication originated.

8. A computer readable memory device embodying a computer program of

- 2 instructions executable by the computer, the instructions comprising:
- 4 receiving at least one communication from each of at least two clients,
wherein each received communication conforms to a client specific
6 protocol;
- 8 determining from which client each received communication was
received;
- 10 determining an application resident on the instrument for which each
12 received communication is intended, wherein at least one application is
resident on the instrument; and
- 14 transferring the received communication to the intended application.
9. The computer readable memory device as recited in claim 8, wherein the
2 client specific protocol is the Standard Commands for Programmable
Instrumentation (SCPI) protocol.
10. The computer readable memory device as recited in claim 8, wherein the
2 communications from the clients are interpreted into an interpreted
command usable by the application module.
11. The computer readable memory device as recited in claim 8, the
2 instructions further comprising:
- 4 separately for each of at least two intended clients, obtaining at least one
additional communication from at least one application, wherein each
6 obtained additional communication conforms to an application specific
protocol;

8 determining from which application each obtained additional
communication was obtained;

10

 determining for which client each obtained additional communication is
12 intended; and

14 transferring each obtained additional communication to the intended
client.

2 12. The computer readable memory device as recited in claim 11, wherein the
 application specific protocol is the Standard Commands for
Programmable Instrumentation (SCPI) protocol.

2 13. The computer readable memory device as recited in claim 11, wherein the
 obtained additional communications are modified to produce client
messages which are in appropriate format for the client.

2 14. The computer readable memory device as recited in claim 11, wherein at
 least one obtained additional communication is in response to one of the
communications received from one of the at least two clients, wherein the
4 application tracks from which client the received communication
 originated, and wherein the application uses that tracking information to
6 direct the at least one obtained additional communication to the client
from which the received communication originated.

2 15. An instrument, comprising:

 at least two server logic modules, wherein each server logic module is
4 configured to receive communications from separate client logic modules,
wherein each received communication conforms to a client specific

6 protocol of the client logic module from which the received
communication was transmitted, and wherein each server logic module
8 is configured to determine from which client the received
communications were transmitted;

10
at least one interpreter logic module configured for formatting the
12 received communications, wherein each server logic module is connected
to and transfers its received communications to one of the interpreter
14 logic modules and wherein each interpreter logic module is configured to
format the received communications from the server logic modules to a
16 format in which it its intended application can respond; and

18 at least one application module resident on the instrument, wherein each
server logic module is configured to determine for which application each
20 received communication is intended, and wherein each interpreter logic
module is configured to transfer the interpreter logic module formatted
22 communications to the intended application.

16. The instrument as recited in claim 15, wherein the interpreter further
2 comprises a parser logic module, wherein the parser logic module is
configured for parsing received communications, wherein each server
4 logic module is connected to and transfers its received communications
to one of the parser logic modules, and wherein each parser logic module
6 is configured to parse the received communications from the server logic
modules to which it is attached.

17. The instrument as recited in claim 16, wherein the interpreter further
2 comprises a stream wrapper and wherein the stream wrapper modifies the
communication to place it in a format more usable by the application.

- 2 18. The instrument as recited in claim 16, wherein the interpreter further
4 comprises a semantics checker logic module and wherein the semantics
checker logic module checks for the validity of various components of the
communication.
- 2 19. The instrument as recited in claim 15, wherein the client specific protocol
is the Standard Commands for Programmable Instrumentation (SCPI)
protocol.
- 2 20. The instrument as recited in claim 15, wherein the application comprises
4 a virtual instrument configured to receive the parsed received
communications, wherein the application further comprises an application
6 logic module configured to receive the parsed received communications
from the virtual instrument, and wherein the application logic module is
configured to perform actions in response to the parsed received
communication.
- 2 21. The instrument as recited in claim 15, wherein the server is configured to
send and receive communications via a connection selected from the
group consisting of USB-488, a GPIB, and a IEEE 488 LAN.
- 2 22. The instrument as recited in claim 15, wherein each interpreter logic
4 module is configured to receive communications from the application
intended for the client associated with that interpreter logic module, to
6 translate the communication received into an appropriate translated
communication having the client specific protocol for the associated
8 client, and to transfer that translated communication to the associated
server logic module, wherein each server logic module is configured to
receive communications from the interpreter logic module associated with
that server logic module and to transmit the translated communications

10 to the client associated with that server logic module, and wherein each
server logic module which receives commands having client specific
12 protocol the same as the application specific protocol of the intended
application is configured to receive communications from that application
14 and to transmit those communications to the client logic circuit associated
with that server logic module.

23. The instrument as recited in claim 22, wherein the application is
2 configured to respond as appropriate to communications received from
clients, wherein the application is configured to track from which client
4 the received communication originated, and wherein the application is
configured to use that tracking information to direct the response
6 communication to the client from which the received communication
originated.